

## CESTODES FROM INDIAN POULTRY

BY

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With the exception of three species, all the *Cestoda* described below were collected by Lt.-Colonel Clayton Lane, I.M.S. (retired), from fowls, at Berhampore, Bengal, India, during 1912 and 1913. The worms were deposited by the writer in the Indian Museum and were sent for identification to the School of Tropical Medicine by Dr. Nelson Annandale, Director of the Zoological Survey of India.

The following is a complete list of *Cestoda* recorded up to the present in fowls from all parts of the world :—

- Metroliasthes lucida*, Ransom, 1900 ?  
*Hymenolepis carioca* (Magalhaes, 1898), Ransom, 1902.  
*Choanotaenia infundibulum* (Bloch, 1779), Cohn, 1899.  
*Bothriotaenia longicollis* (Molin, 1858), Railliet, 1892 (recorded once only).  
*Cotugnia digonopora* (Pasquale, 1890), Diamare, 1893.  
*Dicranotaenia sphenoides* (Railliet, 1892), Railliet, 1896.  
 = *Dicranotaenia cuneata* (Linstow, 1872), Railliet, 1893.  
*Drepanidotaenia infundibuliformis* (Goeze, 1782), Railliet, 1893.  
*Hymenolepis cantianiana* (Pol., 1860), Ransom, 1909.  
 = *Davainea oligophora*, Magalhaes, 1898.  
*Hymenolepis villosa* (Bloch, 1782), Wolffh., 1899.  
*Davainea cesticillus* (Molin, 1858), R. Blanchard, 1891.  
 „ *cozni*, Baczy, 1914.  
 „ *echinobothrida* (Méglin, 1880), R. Blanchard, 1891.  
 „ *exilis* (Duj., 1845), R. Blanchard, 1899.  
 „ *longicollis* (Molin, 1858), Führmann, 1908.  
 „ *mutabilis*, Reuther, 1901.  
 „ *paraechinobothrida*, Magalhaes, 1898.  
 = *D. echinobothrida* ?

- Davainea penetrans*, Baczy, 1914.  
 „ *proglottina* (Davaine, 1860), R. Blanchard, 1891.  
 = *D. dubinis*, Meggitt, 1916 ?  
 „ *proglottina dublanensis* (Kowl., 1894), Führmann, 1905.  
 „ *tetragona* (Molin, 1858), R. Blanchard, 1891.  
 „ *urogalli* (Modeer, 1790), R. Blanchard, 1891.  
 „ *varians*, Sweet, 1910.  
 „ *vigintivasus*, Skriab., 1914.  
 „ *volzi*, Führmann, 1905.  
*Fimbriaria fasciolaris* (Pallas, 1781), Wolfffh., 1899.  
 = *F. malleus* (Goeze, 1782), Froel., 1802.  
 = *F. mitra*, Froel., 1802.

Führmann (1920) has recently split up the old genus *Davainea* (Blanchard) into four genera, viz. :—

- Davainea*, Blanchard. Type *D. proglottina*, Davaine.  
*Davainoides*, Führmann. Type *D. vigintivasus*, Sk., and *D. polycalceola*, Jan.  
*Houttuynia*, Führmann. Type *D. struthionis* (Houtt.).  
*Raillietina*, n.nom.

The latter genus he splits up into four sub-genera, as under :—

- Paroniella*, n.s.g. Type *D. longispina*.  
*Ransomia*, n.s.g. Type *D. tetragona* (Molin).  
*Skrjabinia*, n.s.g. Type *D. cesticillus* (Molin).  
*Johnstonia*, n.s.g. Type *D. echinobothrida* (Még.).

Führmann removes his genus *Ophryocotyloides* from the sub-family *Davaininae* and places it in the sub-family *Ophryocotylinae*, Führmann.

Meggitt (1921), in his paper on tapeworms from the ostrich, gives a key to all the known species of *Davainea*.

The collection dealt with in this paper comprises the following species :—

- Metroliasthes lucida*, Ransom, 1900.  
*Cotugnia digonopora* (Pasquale, 1890), Diamare, 1893.  
*Dicranotaenia sphenoides* (Railliet, 1892), Railliet, 1896.  
*Davainea cesticillus* (Molin, 1858), Blanchard, 1891.  
 „ *echinobothrida* (Mégnin, 1880), Blanchard, 1891.  
 „ *tetragona* (Molin, 1858), Blanchard, 1891.  
*Monophylidium gallinarum*, n.sp.  
*Diorchis*, sp. (*americana* ? Ransom, 1909).

*Metroliasthes lucida*, Ransom, 1900

Numerous specimens from a domestic fowl, *Gallus gallus domesticus*, Angul, Orissa, India: collected by the author in 1912. Numbered Z.E.V.  $\frac{6179}{7}$  in the collections of the Indian Museum.

There appears to be some doubt whether this species has been previously obtained from fowls or not.

*Cotugnia digonopora* (Pasquale, 1890), Diamare, 1893

1. Four specimens from a domestic fowl, Berhampore, Bengal, collected by Lt.-Colonel Clayton Lane, I.M.S.
2. Two specimens as above; collected on 29.5.13.
3. Three specimens as above, 1912.

*Dicranotaenia sphenoides* (Railliet, 1892), Railliet, 1896

= *D. cuneata* (von Linstow, 1872), Railliet, 1893

Five specimens from a domestic fowl, Berhampore, Bengal, collected by Lt.-Colonel Clayton Lane, I.M.S., in November, 1912.

*Davainea cesticillus* (Molin, 1858), R. Blanchard, 1891

1. Five specimens from a domestic fowl, Berhampore, Bengal, collected by Lt.-Colonel Clayton Lane, I.M.S., 1912.
2. One specimen from *Gallus sonnerata* (Zoological Gardens, Calcutta) collected by the author on March 3rd, 1917.

*Davainea echinobothrida* (Mégnin, 1880), R. Blanchard, 1891

1. Three specimens from two domestic fowls, Berhampore, Bengal, collected by Lt.-Colonel Clayton Lane, I.M.S., 1912.
2. Numerous specimens (about 50) from a jungle fowl (*Gallus bankiva*), Berhampore, Bengal, collected by Lt.-Colonel Clayton Lane, I.M.S. Numbered Z.E.V.  $\frac{6177}{7}$  in the collections of the Indian Museum.
3. Three specimens from *Gallus ferrugineus*, Zoological Gardens, Calcutta, collected by the author on May 27th, 1915.

*Davainea tetragona* (Molin, 1858), R. Blanchard, 1891

1. A total of twenty-four specimens were collected from fowls on seven different occasions, in Berhampore, Bengal, by Lt.-Colonel Clayton Lane, I.M.S., in 1912.

The two preceding species are very closely related and Stiles considers them to be identical. *T. tetragona*, however, does not, it is stated, produce

the pathological effects which result from the presence of *T. echinobothrida*, viz., nodular disease.

Ransom, however, points out that *D. echinobothrida* is a larger form than *D. tetragona*, possessing a larger head and rostellum, and larger suckers, hooks, and cirrus pouch; the hooks are also more numerous in *D. echinobothrida* than in *D. tetragona*. In mature forms these characters appear to us sufficient to distinguish between the species.

Meggitt (1921) states that *T. tetragona* (Mol.) possesses 'unilateral genital pores and *D. echinobothrida* (Még.) alternating pores in the adult form and unilateral pores in the young. The two species are closely related and no classification can be regarded as satisfactory which separates them. A character upon which a classification may perhaps be finally based is the behaviour of the uterus and the origin of egg capsules.'

Führmann (1920) considers them distinct, his opinion being based on the pores being unilateral in one and irregularly alternate in the other. In this opinion we concur.

The following worms have not hitherto been described from fowls:—

*Monophylidium gallinarum*, n.sp.

Two specimens from a domestic fowl, Berhampore, Bengal, India, collected by Lt.-Colonel Clayton Lane, I.M.S., in 1912.

**EXTERNAL ANATOMY.** The worms measured about 21 mm. long, and the greatest breadth was 2.5 mm. All the segments were much broader than long, even the posterior ones being shallow. The number of segments was about 130.

*The head.* The head is prominent and measures about 300 $\mu$  long and 500 $\mu$  broad; in both specimens the rostellum was retracted and appeared as a small, bluntly-pointed projection, armed with about 120 hooks, each measuring about 90 $\mu$ , and arranged in 2 rows. The suckers are large, conspicuous, and unarmed. There is no neck.

**INTERNAL ANATOMY** (fig. 1). The outer longitudinal muscular layer consists of a large number of separate dorsal and ventral strands. The lateral water vessels are large and clearly seen, both in the entire worm and in sections.

*Genitalia.* As only two worms were available, it was found impossible to do more than work out the gross details of the anatomy.

*Male genitalia.* There are about 30 globular testes, each measuring about 35 $\mu$ , and these lie for the most part on each side of the ovary, although a few lie in front of it.

*Vas deferens.* The cirrus pouch is large and muscular, and the genital atrium runs anteriorly.

*Female genitalia.* The ovary is situated in the middle of the segment, slightly posterior, and median to, the receptaculum seminis. It measures about  $225\mu$  broad and  $60\mu$  long.

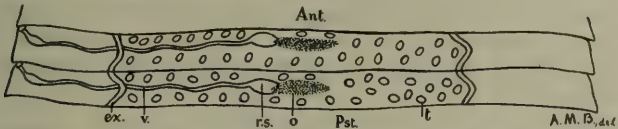


FIG. 1. *Monopylidium gallinarum*, n.sp., horizontal section. *Ant.*, anterior; *ex. v.*, excretory vessel; *o.*, ovary; *Pst.*, posterior; *r.s.*, receptaculum seminis; *t.*, testes; *v.*, vagina.  $\times 50$ .

*Vagina.* The receptaculum seminis measures about  $45\mu$  by  $15\mu$ , and lies on the pore side of the ovary.

The genital pores are unilateral and occur at the extreme anterior corner of the segment. The eggs lie in capsules, each capsule containing from five to nine. The outer egg-envelope measures about  $35\mu$  and the oncospheres about  $25\mu$ .

**DIAGNOSIS.** The number and size of the hooks, the position of the genital pore, the fact that all the segments are much broader than long, and the occurrence of numerous eggs in each capsule, differentiate this worm from any other species of the genus *Monopylidium*.

Johnston (1911) discusses the relationship between the genera *Monopylidium* and *Choanotaenia*.

We consider our species to be new and have therefore named it *M. gallinarum*.

*Diorchis* sp. (*americana*? Ransom, 1909)

Several specimens from a hen, Calcutta, Bengal, India, collected by the author in 1915.

The only points in which our specimens differed from *D. americana*, Ransom, were as follows:—

|                            | Length    | Breadth | Rostellar hooks | Hooks on suckers |
|----------------------------|-----------|---------|-----------------|------------------|
| Our specimens ... ..       | 16 mm.    | 0.4 mm. | absent          | absent           |
| <i>D. americana</i> ... .. | 20-25 mm. | 0.6 mm. | Ten present     | present          |

Two heads only were found amongst our specimens, and in both cases the rostellar hooks were absent, although fragments were to be seen. In spite of careful examination, no hooks were seen on the suckers; possibly they had worn off.

The uterus contained many eggs, but the oncospheres were not fully formed. The outer egg-envelope measured about  $25\mu$  and the embryo  $16\mu$ .

No representative of this genus has previously been recorded from fowls, although they occur occasionally in ducks, coots, sandpipers, flamingoes, etc.

The opportunity is here taken of recording the following *Echinorhynchid*, also obtained from an Indian Jungle fowl:—

*Heteroplus grandis* (Van Cleave, 1916), Van Cleave, 1918  
= *Mediorhynchus grandis*, Van Cleave, 1916

Two females only from the intestine of *Gallus sonnerati* (South Indian Jungle fowl), Zoological Gardens, Calcutta, collected by the author on April 17th, 1917.

The type species was described from *Quiscalus quiscula* (the purple grackle) and has since been recorded by the same writer from *Sturnella magna* (the meadow lark) and *Corvus brachyrhynchus* (the crow).

Our specimens agree in detail with Van Cleave's account of this species except in size. The females described by Van Cleave measured 27 mm. to 35 mm. long, and the greatest breadth was 1.4 mm. Both our specimens measure 80 mm. long, and have a maximum breadth of 3.5 mm.

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